SCIENTIFIC SERIALS

Der Naturforscher, May.—This serial, containing little that is original, furnishes a weekly supply of well-selected and adapted matter from various sources. In the present number attention may be called to an academical address delivered by Herr Streng at Giessen, on the "circle-course" of substances in nature, treating chiefly of geological phenomena; to an account of Herr Janettaz's recent careful researches on the conduction of heat in crystals (some 44 mineral species having been examined); to a theoretical investigation by Herr Handl (Vienna Academy) of the conditions of saturated and supersaturated solutions, and to several papers of meteorological experiment: on moisture in forests and in the open, on the temperature of rain, and on the velocity of winds as measured on various heights on Antwerp Cathedral.—Some observations of M. Du Breuil on the partial decortication of horse-chestnuts, are worthy of notice. He found about twenty of these trees in the park at Compiègne, the bark of which had been eaten off twenty-four years previously, by rabbits, to a height of 30 or 40 centimetres. From several experiments he concluded that the chestnuts could live thus long without communication with the soil, and that the elements necessary to their growth were obtained partly from the atmosphere, partly through endosmose from the woody tissue formed before decortication.—Among several French Academy papers are those by M. Jamin on the laws of the normal magnet, and M. Faye on circulation of hydrogen in the sun.—English and American science is also represented.—A curious fact is stated in the "Kleinere Mittheilungen": Herr Eimer has recently found, on a precipitous rock near the island of Capri, a new species of lizard. It is blue all over, with dark spots on the back; while the lizards in Capri are of a bright green, with only a little blue at the extremities. Now the rock (which is frequented by birds of prey) has little or no vegetation, and its natural colour is a bluish grey, or dark blue in the shaded parts. The lizard, when at rest, can hardly be detected by sight, its colour is so like that of the rock. Herr Eimer finds indications that the rock was once connected with the land, and supposes green lizards to have gone over and been gradually transformed to blue, through natural selection.

THE *American Journal of Science and Arts* for June commences with a biographical notice of Dr. John Torrey, the botanist, who died in March last, in the 77th year of his age.—Mr. G. J. Brush contributes a paper on the analysis of an Anglesite from Arizona, worked out in the Sheffield Laboratory of Yale College.—Prof. Dana discusses some results of the earth's contraction from cooling, including the origin of mountains and the nature of the earth's interior.—Prof. J. H. Eaton has a paper on the relations of the sandstone, conglomerates, and limestone of Sauk County, Wisconsin, to each other and to the Azoic.—Prof. Le Conte replies to Mr. T. S. Hunt's criticisms on his paper on the formation of the great features of the earth's surface.—Mr. Verrill remarks on Mr. Jeffrey's article on "The Mollusca of Europe compared with those of Eastern North America," in which, while differing from that author, who thinks that most of the New World forms are derived from the old, he considers the reverse is the case.—Prof. Young proposes the use of diffraction "gratings" as a substitute for the trains of prisms in a solar spectroscope; and he considers that they might well supersede prisms on account of their lightness and ease in management. Prof. Marsh gives further notices of Tertiary mammals, describing two new genera, *Tillotherium* and *Brontotherium*, allied respectively to *Anchippodus* and *Titanotherium*.

Bulletin Mensuel de la Société d'Acclimatation de Paris.—The April number of this serial has only just come to hand. It gives details of all the prizes in the gift of the Society for papers or works on matters in which it is specially interested, or for success in carrying out its objects in the acclimatisation or improvement of various animals or plants. No less than 88 prizes, of the money value of more than 75,000 fr. (3,000*l.*), remain to be competed for, besides 31 medals. By this means the Society does much to popularise the work it has in hand, and to make known the experience gained by those who have interested themselves in it. The system of lending specimens, on condition of receiving, for further distribution, a certain part of the produce, is explained in a paper by M. Passy, the vice-president. It appears that Algeria and Madeira, Guadeloupe and Martinique, besides Switzerland, Russia, Italy, Austria, and some other European countries, are brought within the field of the Society by means of branches, or affiliated societies of a similar nature.—A paper entitled "Le Jardin de mon Grandpère," by Edmond About, the George Augustus Sala of French literature, gives some idea of the benefits conferred by careful cultivation. "To increase the resources given by Nature to man is a task at once too noble and too useful not to induce the sympathy and earnest assistance of people in all parts of the world." Such is the aim of the Society. The last year has had good results. Foreign countries have all been made to give their quota towards increasing the material wealth of France and the knowledge of those interested in the Society. "China, hitherto so unknown, will soon have no secrets from us. A work on the ichthyology of the Celestial Land has given details as to the modes of pisciculture in that country." The financial position of the Society is satisfactory, the balance-sheet for 1872 showing receipts 54,944 fr. (2,200*l.*), and expenditure 45,704 fr. (1,828*l.*).

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 15.—On a Periodicity of Rainfall in connection with the Sun-spot Periodicity, by C. Meldrum, Director of the Meteorological Observatory, Mauritius. Communicated by Sir Edward Sabine.

Assuming that there is a sun-spot periodicity, in the course of which the sun undergoes a variation with respect to heat, or some other form of energy, we should expect to find a corresponding variation in the state of our atmosphere.

With this idea, it was some time ago determined to discuss the cyclones that had occurred during the last twenty-five years in the Southern Indian Ocean, and it was found, what had been often surmised, that they were more frequent and more violent in the maxima than in the minima sun-spot years.

It is well known that the cyclones of the Indian Ocean are attended with much rain, which is not confined to the body of the storm, but extends over wide areas. Years remarkable for cyclones, therefore, should be also years remarkable for rain; but to test this inference, with regard to the Indian Ocean, we had no rainfall statistics, except eighteen years' observations at Mauritius; and these were in every respect favourable, the rainiest years having been those in which cyclones were most abundant. In the absence of other data, the Brisbane and Adelaide rainfalls were consulted, and it was found that, like Mauritius rainfall, they indicated a periodicity. It was then surmised that there might be a rainfall periodicity generally; and that, if such was the case, both it and the cyclone-periodicity were concomitant effects of one and the same cause. This supposition having been strengthened by the results of an examination of the rainfall of England, it was resolved to examine all the rainfall tables (containing one or more sun-spot periods) that could be obtained. By comparison of an extensive series of weather statistics kept at a large number of places all over the world, the decided conclusion is that, with scarcely an exception, all the years of maxima and minima rainfall are within a fraction of the corresponding maximum and minimum sun-spot year.

Chemical Society, June 19.—Dr. Odling, F.R.S., president, in the chair.—Nine communications were read, of which the following are the titles:—1. "Researches on the Action of the Copper Zinc Couple on Organic Bodies III. on Normal and iro-propyl iodide," by J. H. Gladstone, F.R.S., and A. Tribe, being a continuation, in the propyl series, of the author's previous researches. 2. "On the Influence of Pressure on Fermentation, Part 4. The influence of reduced atmospheric pressure on the alcoholic fermentation," by Horace T. Brown, in which he finds that, under diminished pressure, the progress of the alcoholic fermentation is retarded in a remarkable way. 3. "On Cymene from different Sources, optically considered," by J. H. Gladstone, F.R.S. 4. "Note on the Action of Bromine on Alizarine," by W. H. Perkin, F.R.S. This reaction gives rise to *Bromalizarine*, an orange-coloured crystalline substance, possessing feebler dyeing properties than pure alizarine, the colouring principle of madder. 5. "On some Oxidation and Decomposition Products of Morphine Derivatives," by G. L. Mayer and C. R. A. Wright, D. Sc. 6. "On the Decomposition of Tricalcic Phosphate by Water," by R. Warrington. 7. "Communications from the Laboratory of the London Institution, No. XII.": "On the Nature and on some Derivatives of Coal-tar Cresol," by Dr. H. E. Armstrong and C. L. Field,

8. "On a new Tellurium Mineral, with Notes on a Systematic Mineralogical Nomenclature," by J. B. Hannay. 9. "Note on the Relation among the atomic Weights," by J. A. R. Newlands. The president, in adjourning the meeting until after the recess, congratulated the members on the number and importance of the papers that had been read during the session.

Zoological Society, June 17.—The Viscount Walden, F.R.S., president, in the chair.—Mr. Sclater laid before the meeting the first sheets of a catalogue of the birds of the Neotropical Region, prepared by himself and Mr. Osbert Salvin, and shortly to be published under the title "Nomenclator Avium Neotropicalium." The number of species included in it, as known to the authors, was 3,565.—Mr. Sclater exhibited and made remarks on a collection of birds recently made in New Guinea by Signor D'Albertis. The most remarkable of them was a new Paradise bird belonging to the Epimachine Section, but peculiar for its long incurved bill, which was proposed to be called *Drepanephorus albertisi*, after its discoverer.—Mr. J. W. Clark exhibited the skull of a Seal from the Northern Pacific, which appeared to be *Halicyon richardsi*, of Gray, and explained his reasons for regarding it as indistinguishable from *Phoca vitulina* of the North Atlantic.—A communication was read from Lord Walsingham, giving particulars as to the distribution of the different species of Deer and other Ruminants of Oregon and Northern California.—Dr. A. Leith Adams read a memoir on the osteology of the Maltese Fossil Elephants, in which was given the description of a large collection of remains discovered by him in Malta in the years 1860-1866. Dr. Adams referred these remains to two distinct species—a larger *Elephas mnaidriensis*, and a smaller—the *E. melitensis* of Falconer, and assigned *E. falconeri* of Busk to a smaller form of the latter species.—Mr. H. J. Elwes read a paper on the geographical distribution of Asiatic birds, in which he entered into the question of the best subdivision of the Indo-Malayan Region.—A communication was read from Mr. W. S. Atkinson, of Darjeeling, containing the description of a new genus and species of *Papilionidæ* from the South Eastern Himalayas, proposed to be called *Bhutanitis lidderdalii*.—Mr. R. B. Sharpe contributed the fourth of a series of papers on African birds. The present memoir dealt with the African Cuckoos, which were fully described and their geographical distribution pointed out.—Mr. R. B. Sharpe read a second communication, describing three new species of birds, proposed to be called *Macrodipteryx sperlingi* from the Bay of Malimba, West Africa, *Chamætylas princei* from the Gold Coast, and *Baza erythrothorax* from Celebes.—Mr. Sclater read a paper on the Curassows, based mainly upon specimens now or lately living in the Society's Gardens, and gave details on their geographical distribution and on the variations of sex of the known species.—A communication was read from Mr. R. Swinhoe on Chinese Deer, with notices of two new species proposed to be called *Cervus kopschi* and *C. euopis*.—Mr. Sclater read a note on the genus *Ornithion* of Hautlaub, and the synonymy of the four known species.—Mr. A. H. Garrod read a memoir on certain muscles of the thigh of birds and their value in classification, founded principally upon the examination of a large number of specimens that had lived in the Society's collection. This meeting closes the Scientific Session 1872-73.

Anthropological Institute, June 17.—Prof. Busk, F.R.S., president, in the chair.—Mr. J. G. Waller exhibited a series of bronze implements discovered on the site of an ancient camp near Hythe, Kent; and Mr. J. E. Price exhibited pottery and bones of *Bos* found at New Southgate.—Lieut. C. S. Holland read a paper on "The Ainos." The following papers were also read:—Account of an interview with a tribe of Bushmans in South Africa, by G. W. Stow, F.G.S.—Specimens of native Australian languages, by A. Mackenzie.—A brief account of three microcephales, by Dr. John Shortt.—On a patoo-patoo from New Zealand, by Sir Duncan Gibb, Bart.—The healing art in the North of Scotland in the olden time, by Rev. Walter Gregor, M.A.—On a hypogeum at Valaquil, Isle of Uist, by A. Carmichael.—Heathen ceremonies still practised in Livonia, by the Baron de Bogouschefsky.—The westerly drifting of nomads from the 15th to the 19th century, Part XI.—The Bulgarians, by H. H. Howorth.

Entomological Society, June 2.—Sir Sidney S. Saunders, V.P., in the chair.—Mr. Müller exhibited a remarkable *Psyche* case, sent by Mr. Rothney from Calcutta. It was composed of thorns, all of equal length (about 1½ inches), arranged with the points all in one direction, so as effectually to guard the entrance against an enemy.—Sir Sidney Saunders exhibited a series of living Hymenopterous larvæ and pupæ in briar stems lately received from Albania. These stems having been split, showed the occupants in their natural cells. Specimens of the perfect insects reared from the larvæ were also exhibited.—Mr. Müller communicated some notes on the discovery by Dr. Joly, of Toulouse, of a nymph belonging to the genus *Oligoneuria*, the immature state of which had been hitherto quite unknown. Drawings of the upper and under sides of the nymph accompanied the notes.—Mr. Wollaston communicated a valuable paper "On the genera of the Cossonidæ." It comprised (1) a catalogue of the several groups, arranged systematically and tabulated; (2) full generic diagnoses, taken seriatim; (3) Observations (diagnostic and geographical) on each separate genus; (4) brief characters of 139 species not hitherto recorded; (5) a complete list of the particular members of the family (amounting in all to 253).—The Secretary read a letter he had received from Mr. Roland Trimen, of Cape Town, containing some remarks on the Rev. R. P. Murray's "Notes on Variations of Neuration observed in certain Papilionidæ," published in the Proceedings of the Society in November last, and referring certain cases of variation to reversion to ancestral characters, pointing to a remote community of origin between the Papilionidæ and the higher Heterocera.

BERLIN

Geographical Society, June 7.—Baron Richthofen, president, in the chair.—Dr. Neumayer spoke on methods of measuring the temperature of the water of the sea at great depth, and a new instrument for that purpose, invented by himself. The discovery of the fact that the bulb of an ordinary mercurial thermometer does not indicate correctly the temperature when subjected to the pressure of many atmospheres such as prevails at great depth, and that the errors of any single reading may react as much as 12 degrees of Fahrenheit, first led to the improved method of surrounding the bulb with a larger one filled with alcohol. The thermometrical errors, so far as they relate to the working of the instrument itself, are thereby nearly abolished. The difficulty, however, remains of ascertaining the point in the scale which the column of mercury reaches at any required depth of water. The various methods devised for overcoming it are chiefly directed towards the introduction of means for indicating the maximum and minimum points. No one of them fully answers this purpose. Any further improvement must therefore have for its object the reading of the thermometer while under water. A step in this direction was made by Mr. N. Siemens, but it was argued that the results arrived at by this method are not satisfactory, although it may eventually be improved. Dr. Neumayer's new principle is based upon the plan of devising a self-registering thermometer which may be lowered into the sea, and his first object was to find out a kind of light which should be able to do photographic work and yet not create errors by producing heat. The Geissler tubes answer these conditions, chiefly those filled with nitrogen, which emit a bright light and do not affect the temperature in any measurable degree. The new apparatus, which was exhibited and experimented with, consists of a large vessel of brass containing (1) two vertical thermometers, which perforate the bottom and protrude into an open compartment underneath, free to the access of water; (2) a galvanic battery, with two Geissler tubes inserted, running in front of, and close to, the thermometers; (3) two rolls of Talbot paper standing upright and immediately back of the thermometers, and revolving by means of a clockwork. As soon as the batteries are closed and the clockwork wound up, the luminous columns of the nitrogen cause the picture of the column of mercury to be reproduced on the photographic paper behind, together with all the lines marking the partition of the scale. The vessel is shut hermetically and lowered into the sea to any required depth. When raised again, the record of the temperature which the surrounding water had at any minute, and therefore at the particular depth to which the apparatus was then lowered, is read distinctly on the paper. An additional improvement was made by attaching on the top of the instrument a compass-card turning freely around its axis, and on the outside of the vessel a sort of wing, which will be directed by the current when the ship is in a slight motion. By an ingenious contrivance the deviation of the direction of the wing from the north and south line of the card is indicated by the same photographic means. It is believed that the direction of the current at various depths will thus be determined.—Mr. Siemens proposed to use chased copper in the place of brass in constructing the vessel, on account of its offering greater resistance to pressure, and believed to have already found satisfactory means for improving the instrument invented by himself and his brother.—Dr. Marthe gave an account of Khiwa based on the study of Russian literature on the subject, winding up with the suggestion, that the withdrawing of a large body of the water from the Amu for the irrigation of the oasis, deprived the lake Aral of so large a supply, that to this circumstance might be due the diminution its surface has suffered, and the fact of its present isolation. The water which before took its way through lake Aral to the Caspian, now evaporates from the rice-fields of Khiwa.

Geological Society, June 4.—Dr. J. Ewald in the chair.—Baron Richthofen drew attention to the activity recently displayed, according to newspaper reports, by several volcanoes of Japan, some of which have not been active for a long time, and gave an account of the distribution of volcanoes in Japan. The west and east portion of the aggregate body of the Japanese islands (leaving out of consideration the small inland passages), is in every way the direct continuation of the mountain system which occupies the south-eastern portion of China, the axial chain of which extends from the frontier of Annam to the island of Chusan, in the direction of W. 30° S.; E. 30° N. It is accompanied on either side by a number of parallel chains. The prolongation of the main portion of this group of linear chains passes through the island of Kiushiu to the great bend of Japan; and in that entire region of country, the structure of the hills, the rocks of which they are made up (chiefly Silurian and Devonian strata accompanied by granite), and the lines of strike are the same which were observed in south-eastern China. This first system is intersected, at either end, by another which runs SS.W., NN.E. On the west, it commences in Kiushiu, and extends southward in the direction of the Liu-Kiu islands, while on the east it constitutes the northern branch of the main island, and, with a slight deviation in its course, continues through the islands of Yesso and Saghalin. A third system, which does not properly belong to Japan, is indicated by the S.W. and N.E. line of the Kuril islands. The first system, where it occupies the breadth of the country for itself alone, is as free from volcanoes or any accumulation of volcanic rocks as it is in south-eastern China. The second is accompanied by volcanoes. But the greatest accumulation of volcanic rocks, as well as of extinct volcanoes, is found in the places of interference, or those regions where the lines of the two systems cross each other; and besides, in that region where the third system branches off from the second. To the same three regions of interference those volcanoes are confined which have been active in historical times. Some details were then given regarding the structure of Kiushiu. This island, although having its longer axis directed from north to south, is intersected, as it were, by several solid bars made up of very ancient rocks, and following the strike of W. 30° S., E. 30° N. They form high mountain barriers, the most central of which (south of the provinces of Higo and Bungo) rises to over 7,000 feet, and is extremely wild and rugged. Among the details regarding the volcanoes of Satsuma, particular attention was drawn to the fact that the various families of volcanic rocks have arrived there at the surface in exactly the same order of succession as is the case in Hungary, Mexico, the Great Basin, and many other volcanic regions, namely, 1st, Propylite, or trachytic greenstone; 2nd, Andesite; 3rd, Trachyte and Rhyolite; and 4th, the basaltic rocks. There is the greatest accumulation of mountain masses in Japan, one of the several chains rising to upwards of 11,000 feet in its summits. Among them are situated several gigantic volcanoes, such as Fusi-yama, the highest of all, Yatsunga-Jake, a series of elevated cones with extinct craters, and several others partly active and partly extinct. Those of the third group were not visited by Richthofen.—Prof. E. Weiss exhibited some curious octahedral crystals of Hausmannite, remarkable on account of certain re-entering angles and the striated aspect of the faces, and proved that the lines which caused this appearance were due to a kind of twin formation not hitherto observed.

Paris

Academy of Sciences, June 23.—M. de Quatrefages, president, in the chair.—The following papers were read:—Second note on guano, by M. Chevreul.—New researches on the silent electric discharge, by MM. P. and A. Thenard.—Researches on chlorine and its compounds, by M. Berthelot. The author dealt with the compounds of chlorine with water and the protosalts.—A new series of observations on the solar protuberances; new remarks on the relations between protuberances and spots, by Father Secchi. The Rev. Father presented his observations for the last quarter, and then, in his letter, criticised Respighi's late remarks on the absence of the chromosphere over spots, which he maintains is not the case. He then gave an account of some experiments on sodium vapour, which, however, contained nothing new, and then proceeded to state that the line D_3 appears to him to coincide with one of the components of the D group which appears when the sun is near the horizon. He has also found a bright iron line between b_2 and b_3, and having examined the spectrum of iron with a battery of 50 cells, has seen 480 lines, but could not find 1474 Kirchhoff; he hopes to repeat this experiment, and if the results are same, he considers that the absence of Fe from the corona will be proved. With magnesium in the lamp, he finds the same nebulosity as is exhibited by the sodium lines, but it is accompanied by a banded spectrum of MgO; he thinks that if the nebulosity is also due to the oxide, that the occurrence of oxidation in the sun will be proved.—On the influence of atmospheric refraction as it affects the time of contact in a transit of Venus, by M. E. Dubois.—On the coloration and greening of *Neottia Nidus-avis*, by M. E. Prillieux.—On semi-diurnal barometric variations, by M. Broun.—On hot-air warming apparatus, by M. Ducrot.—A letter was received from M. de Lesseps praying the Academy to include his name among those of the candidates for the vacant seat of Académicien libre, vacant by M. de Verneuil's death.—On the constitution of the sun and the theory of the spots, by M. E. Vicaire.—On the production of methylic alcohol by the distillation of calcic formate, by MM. C. Friedel and R. D. Silva. The authors believe that formic aldehyde is first formed by the reaction $(CHO_2)_2Ca = CO_2Ca ? + H_2O + CH_2O$, and that the aldehyde is converted into alcohol by the action of nascent hydrogen.—On terebene, by M. J. Ribau.—On the production of the rotatory power in the neutral derivatives of mannite, by M. G. Bouchardat.—An answer to a late note, by M. du Moncel, on the resistance maxima of induction coils, by M. Raynaud.

DIARY

FRIDAY, July 4.

Geologists' Association, at 8.
Archæological Institute, at 4.
Horticultural Society, at 3.—Lecture.

SATURDAY, July 5.

Geologists' Association.—Excursion to Plumstead and Crossness.

MONDAY, July 7.

Geographical Society, at 8.30—Boat Journey up the River Wami: C. C. Hill.—Remarks on Zanzibar and the East Coast of Africa: Sir Bartle Frere, K.C.B., president.
Entomological Society, at 7.

BOOKS RECEIVED

American.—Families of Fishes: Theo. Gill (Smithsonian Institution).—Memoir of Sir Benjamin Thompson, Count Rumford, 2 vols: George Ellis (Claxton & Co, U.S.A.).—U.S. Sanitary Commission in Valley of Mississippi, 1861–6: Dr. Newberry (Cleveland, U.S.A.).—Geological Survey of Indiana: E. T. Cox (Indianopolis, U.S.A.).

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